THE USE OF MAGNESIUM SULPHATE IN CANCER

BY R. PERCY WRIGHT, F.R.C.S.(C.),

Associate Laryngologist, Montreal General Hospital,
Laryngologist, Children's Memorial Hospital,
Montreal

IN presenting the results obtained by the use of magnesium sulphate in the treatment of carcinoma it is not with the intention of making any claim either for curative or palliative value but rather in the endeavour to stimulate interest and render further trial and observation possible.

At the Montreal General Hospital the end-results in the majority of malignant lesions of the pharynx, base of the tongue, œsophagus, and in extrinsic laryngeal cases have been most disappointing, whether the cases were attacked by surgery, electro-coagulation, radium or deep x-ray. The same may be said for the results published by other clinics where the average malignant case is first seen in a more or less well advanced condition. Even by improving our present technique, or by acquiring larger quantities of radium, little further of practical value can be offered to this class of patient.

What cancer is, what the "X" underlying the cause of cancer is, has yet to be answered. It is not even a certainty whether cancer is a purely local condition or a systemic disease, but I believe that even if a malignant growth be thoroughly and completely destroyed, whether by surgery or by irradiation, that "X" is still present in that patient and he remains in the same category as he was before the tumour manifested itself, namely, a potential cancer subject. No assurance, and certainly no guarantee, can be given to any cancer sufferer after he has submitted himself for treatment that he will be immune from future recurrence.

My attention was first drawn to the possible effect of magnesium sulphate for the treatment of carcinoma by the fact that at the Radium-hemmet in Stockholm, Sweden, it is given as a routine treatment for leukoplakia, ordinary warts and papillomata, which are recognized precancerous conditions. To quote from "The Technique in the Treatment of Tumours at Radium-hemmet, Stockholm," by E. Berven, J. Heyman and R. Thorams—"In recent years we do not give radium treatment, but try at first medicinal treatment. As a rule we give 1 gr. of magnesium sulphate three times daily, and the patient is kept on this for three months. The leukoplakias are markedly reduced on this treatment. This treatment has been based on the experience gained from the effect of $MgSo_4$ on papillomata and ordinary warts."

The multiple warts on the hands which occur epidemically in children respond in a remarkable degree to treatment with $MgSo_4$ internally. The treatment must be continued for 2 to 3 months and must be carefully watched. In about 40 per cent of the treated cases the warts are completely absorbed, and in other cases the majority of them disappear while the mother-warts themselves remain.

Many references may be found in the literature regarding magnesium sulphate and other salts, particularly sodium, calcium and potassium, regarding their relationship to malignancy. As Shear,[1] of the Harvard Medical School, has recently pointed out, there is so much contradictory evidence up to the present time that no conclusion can be drawn.

Contributions by Brumpt[2] and by Schrumpf-Pierron[3] show that carcinoma is approximately ten times less frequent in Egypt than in European countries, and these authors endeavour to prove that this is intimately linked with the richness in magnesium of the soil and water.

If relatively small doses of $MgSo_4$ have a beneficial effect in the treatment of pre-cancerous conditions, as demonstrated at the Radium-hemmet, Stockholm, and, secondly, if the observations made by Schrumpf-Pierron and others are correct, that $MgSo_4$ is present in the soil, and consequently the daily consumption of this salt in the drinking water and foodstuffs prevents the occurrence of cancer, then we might inquire whether larger doses would have any beneficial effect upon the mature cancerous tumour. For these reasons I determined to try its

effect upon some of our apparently hopeless cases.

The first three case reports I shall give in some detail. Several others have been given a trial with the salt and have shown little or no improvement and have followed the usual course, particularly those with bone involvement.

CASE 1

E.E., male, aged 40 years (Hosp. No. 877-33) was on February 12, 1933, admitted to the Montreal General Hospital.

Complaints.—Obstructed nasal breathing; lumps on the neck. The symptoms were first noted 5 months previously.

Family history.—Mother died of cancer of the breast; otherwise, irrelevant.

Present condition.—A large sloughing mass completely filled the nasopharynx. Nasal breathing was impossible. The cervical glands on both sides were enlarged, a large fixed mass on the right side, extending downwards from the mastoid process. Multiple discrete movable glands present on both sides of the neck, from the size of olives to that of peas.

February 13, 1933. Biopsy from the nasopharynx; pathological report — epidermoid carcinoma, Broder type 3.

February 15, 1933. Columbian paste radium collar applied. A full erythema dose was given.

March 6, 1933. 50 mg. radium tube to the nasopharynx for 20 hours.

March 11, 1933. Discharged from the hospital; general condition poor. He has lost 30 lbs. in the past 6 weeks; weight, 130 lbs.

March 29, 1933. Has had three 1/6 erythema doses of deep x-ray. His general condition was so poor that further x-ray treatment was considered inadvisable. Morphine, ¼ gr., three times a day.

April 2, 1933. Began $MgSo_4$. May 3, 1933. General condition much improved. May 22, 1933. Glands still palpable, but greatly reduced in size. Morphine, ¼ gr., at night only.

June 20, 1933. Weight, 141½ lbs. He was wearing his usual collar for first time.

August 28, 1933. Nasal breathing normal. Weight, 158 lbs.

November 3, 1933. He had returned from a trip to England. Weight 176 lbs. The mass was still palpable on the left side of the neck. A further biopsy made from the granulation tissue in the nasopharynx, showed epidermoid carcinoma, Broder type 3.

February 19, 1934. Weight 179 lbs. Nasal breathing free; gland still palpable on the left side of the neck; no complaint of pain or discomfort.

CASE 2

Mrs. C.P., aged 54 years, had been under observation at the Montreal General Hospital, Ear, Nose and Throat Clinic, since August, 1928. At that time a hard tumour was present involving the left ethmoid and antrum, occluding the left nares and pressing the nasal septum to the opposite side. She received varying doses of deep x-ray therapy.

June, 1930. She had a large hard mass completely obstructing the left nares and protruding anteriorly through the vestibule. The posterior choana was obliterated. The soft tissues over the bridge of the nose and left lachrymal were involved.

November, 1930. Weight, 144 lbs.

Throughout 1930, 1931 and 1932 she was given repeated treatment with radium needles, radium tubes in the left maxillary antrum, radon seeds in the soft tissues over the bridge of the nose, and broken doses of deep x-ray. The tumour was reduced in size and her nasal breathing was seemingly normal.

December, 1932. She was readmitted to the wards suffering from a bilateral suppurative otitis media, following an attack of influenza.

January 5, 1933. Simple mastoidectomy was performed upon the left side.

January 9, 1933. Ligation of the left internal jugular vein.

February 5, 1933. Discharged. The nasal passages were very foul and filled with fœtid crusts.

March, 1933. Treatment with $MgSo_4$ was begun.

June, 1933. The mass in the nares showed regression. The fœtor had disappeared. Weight, 149 lbs.

July 7, 1933. A sequestrum was found under the left lachrymal area with a small fistula.

August 11, 1933. Weight, 150 lbs.

September 8, 1933. Weight, 154 lbs.

October 30, 1933. She stated that for the first time in three years she had had no pain or discomfort. There was, however, fœtor from the sequestrum.

February 16, 1934. Weight, 156 lbs. She stated that she had not felt so well for years. Nasal breathing free; a small sequestrum still present.

CASE 3

J.N., male, aged 65 years, single, clerk, on December 6, 1932, consulted the Ear, Nose and Throat Out-patient Clinic at the Montreal General Hospital.

Complaint.—Hoarseness for three days. Indirect examination showed a definite tumour mass with ulceration in the area of the right arytenoid and aryepiglottic fold. Provisional diagnosis.—Extrinsic carcinoma of the larynx. A Wassermann test was reported negative.

December 6, 1932. Biopsy.—Pathological report, adenocarcinoma, Broder type 4. Operative interference was considered inadvisable, likewise irradiation. He reported at the clinic twice. A fungating mass rapidly increasing in size.

February 28, 1933. Growth had increased considerably. There was difficulty in swallowing. Admission for gastrostomy was recommended.

April 3, 1933. Emergency tracheotomy.

April 21, 1933. He was discharged from hospital wearing a tracheotomy tube and able to swallow semi-fluids.

April 28, 1933. Treatment with $MgSo_4$ was begun.

June 2, 1933. Feeling much better.

June 20, 1933. Weight, 168 lbs. He gained 4 lbs. in 3 weeks.

July 4, 1933. No apparent change in size of tumour, but it was cleaner. He was swallowing well, and could breathe with the tube blocked for 10 minutes.

August 18, 1933. Very little slough or mucus present.

September 12, 1933. Larynx clean.

September 26, 1933. Larynx clean; no difficulty in swallowing.

October 17, 1933. The tumour was markedly reduced in size; swallowing ordinary food. He could breathe comfortably without the tube. Weight, 204 lbs. He was taking long walks daily to reduce weight.

October 30, 1933. Weight, 206 lbs. No discomfort either in breathing or swallowing.

February 16, 1934. No symptoms of pain. Weight was being maintained; no difficulty in swallowing. He breathed with the tracheotomy tube corked for an indefinite period.

CASE 4

Mr. M., aged 76, with cancer at the base of the tongue, referred by Doctor Bazin. Fixed cervical glands coherent to the mandible. He had had radium applied while in Vancouver. He began $MgSo_4$ in June, 1933, with definite relief from pain and salivation, but did not tolerate the salt well. Gastrostomy done in August. He died late in October from a sudden cardiac attack.

The method of administration has been purely empirical up to the present. The patient has been given 3 i to 3 ii $MgSo_4$ in water by mouth, 2 to 3 times daily, depending upon the bowel tolerance; that is allowing 3 to 4 loose stools daily, but avoiding purgation or distressing symptoms. The salt may be given with milk, orange juice, or, as at the Montreal General Hospital, in the form of a mixture flavoured with elixir of pepsin and camphor water. Some of our patients become very tolerant to the salt, and the quantity can be rapidly increased. Recently we have been using a 25 per cent hypotonic solution of $MgSo_4$ intramuscularly, but it is too early to make any comment upon this method of administration.

In conclusion, I wish again to state that no claim can be made as to curative value, but in certain cases treated we have noted: (1) retrogression in the size of the tumour and clearing of the slough; (2) relief from pain; (3) increase in body weight; (4) very marked improvement in the mental attitude of the patient; (5) the induction of a feeling of well-being.

BIBLIOGRAPHY

1. SHEAR, M. J.: Rôle of sodium potassium, calcium and magnesium in cancer. From the office of Cancer Investigation, U.S. Public Health Service, Harvard Medical School, *Am. J. Cancer*, 1933, **18**: 924.
2. BRUMPT, E.: Alleged rarity of cancer in Egypt, *Bull. Acad. de Med.*, 1931, **105**: 908.
3. SCHRUMPF-PIERRON, P.: Cancer in Egypt, *Bull. Ass. franc. Etude du Cancer*, 1931, **20**: 307-322.
4. DELBET, P. AND FRANICEVIC: Influence of halogen salts of magnesium on hydrogen-ion concentration of the urine of cancer patients, *Bull. Acad. de Med.*, 1930, **104**: 668.
5. BOLAFFI, A.: Influence of magnesium-ion on growth of Ehrlich adenocarcinoma of mouse, *Tumori*, 1930, **16**: 420-424.
6. DELBET, P.: Influence of magnesium salts on tar lesions in rabbits, *Bull. Ass. franc. Etude du Cancer*, 1930, **19**: 175.
7. LORENZETTI, F.: Relation between pregnancy, carcinoma and the magnesium content of the tissues, *Clin. Ostet.*, 1931, **33**: 129-139.
8. LIVERRO: Treatment of laryngeal papillomas and carcinomas by intravenous injection of hypertonic magnesium sulphate solution, *Valsalva*, 1931, p. 367.
9. ERNST, G.: The use of chemotherapy in the treatment of carcinoma, *Strahlenther*, 1932, **44**: 97-108.
10. BOLAFFI, A.: Influence of magnesium chloride on mouse adenocarcinoma, with special reference to the tumour content of calcium, magnesium and potassium, *Tumori*, 1930, **16**: 201-211.

WHY LATE DIAGNOSES IN MALIGNANCY?

(AN ANALYSIS OF TWO HUNDRED LATE DIAGNOSES)

BY E. E. SHEPLEY, M.B.,

Director of Radiotherapeutics for the Saskatchewan Cancer Commission, Saskatoon, Sask.

THE object of this analysis is an examination of some of the many factors that enter into the situation of late diagnoses in malignancy. The data presented have been secured by questioning 200 consecutive patients with malignancy who have presented themselves with evidence of a late diagnosis. For the purposes of this analysis, cases have been considered late whenever the primary lesion was massive, when ulceration and mixed infection obtained, when invasion of adjoining tissues was definitely apparent, when the primary or secondary glandular areas were involved, or whenever, as the result of the condition, definite constitutional disturbance was in evidence.

That late diagnoses in malignancy not only lend complexity to treatment but also perpetuate unnecessary terminal disaster is the emphatic testimony of all those who labour in this particular field of medical endeavour. That early diagnosis could help in saving many lives now unnecessarily lost, that it could prevent untold suffering, and also that it could effect a tremendous economic saving in lessening treatment costs, hospitalization periods, and post-treatment invalidity, is not likely to be questioned by any who are at all familiar with the existing situation.

Of the total cases examined in this series, there were 62 involving the breast, 52 of the uterus, 42 of the gastrointestinal tract, 38 of the lip, 18 of the skin, 13 of the buccal cavity, 12 genito-urinary, 12 of the jaw, 9 of the ear (pinnal), 8 of the eye (cutaneous), 7 of the lung, 5 of the nose (cutaneous), 3 of the chest, 3 of the thyroid and 3 of the tonsil; also 8 cases of sarcoma. Of this total material 200 were selected as definitely late in finally reporting for diagnosis and treatment.

As to why there should be such a situation of tardy recognition and late treatment, it was early apparent that practically all late cases could be classified under certain rather definitely circumscribed headings. Under these headings or combinations thereof, could be found the explanation, and quite probably they also represent